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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,454	12/23/2003	Ji Myong Lee	021906-0307405	9617

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EXAMINER	
ESTRADA, MICHELLE	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/743,454	LEE, JI MYONG	
	Examiner	Art Unit	
	Michelle Estrada	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 10/28/05
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (6,395,635) on view of Wang et al. (2003/0003745).

Wang et al. disclose depositing an insulator layer (26) on the semiconductor wafer (14); performing a first polishing process on a surface of the insulator layer deposited on the semiconductor wafer (14) while supplying slurry to the surface of the insulator (Col. 6, line 58); and performing a second polishing process on the surface of the insulator layer while supplying water to the surface of the insulator layer (Col. 6, line 59); wherein the insulator layer is an inter metal dielectric (IMD) layer (Col. 6, lines 55-56).

Wang et al. do not disclose wherein the IMD is made of TEOS.

Wang et al. ('745) disclose deposing an insulator (IMD) (18) on a semiconductor wafer; wherein wherein the IMD is made of TEOS (Page 2, Paragraph [0016]); and planarizing the IMD with chemical mechanical polishing (CMP).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Wang et al. ('635) and Wang et al. ('745) to enable the IMD material of Wang et al. ('635) to be the IMD material according to the teachings of Wang et al.

('745) because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of choosing the disclosed IMD material of Wang et al. ('635) and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07. Furthermore, the IMD reduces the interconnection parasitic capacitance, consequently reducing the RC delay, or mitigating the cross talk between metal lines, hence the operation speed is improved.

One of ordinary skill in the art would have been led to the recited % of thickness removed by the first polishing step and the remainder removed in the second polishing step to routine experimentation to achieve a desire rate of polishing and desired quantity of thickness to be removed. Also, the % of thickness removed will depend on the polishing time and the amount of slurry supplied to the insulator layer, which are result effective variables, therefore the % of thickness removed is a result effective variable too. See MPEP 2144.05.

Furthermore, it is obvious to one of ordinary skill in the art that the first polishing step will remove a greater percentage of thickness because it contains slurry with abrasives that obviously will remove a greater amount of thickness than water.

In addition, the selection of % of thickness removed by the first polishing step and the remainder removed in the second polishing step, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also

In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Note that the specification contains no disclosure of either the critical nature of the claimed % of thickness removed by the first polishing step and the remainder removed in the second polishing step or any unexpected results arising there from. Where patentability is said to be based upon particular chosen % of thickness removed by the first polishing step and the remainder removed in the second polishing step or upon another variable recited in a claim, the Applicant must show that the chosen % of thickness removed by the first polishing step and the remainder removed in the second polishing step are critical. *In re Woodruf*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Response to Arguments

Applicant's arguments filed 10/7/05 have been fully considered but they are not persuasive.

Applicant argues that the process of Wang is different from that of the present invention at least because it requires the use of a slurry to planarize the surface

followed by the use of a slurry to polish the surface and remove the tungsten damascene residue. However, Applicant is directed to Col. 4, lines 24-35 of Wang et al. ('635) where it is described a planarization of a IMD layer 26 and in Col. 8, lines 42-50 explains the use of a first slurry followed by a second step of planarization with water.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michelle Estrada
Patent Examiner
Art Unit 2823

ME
December 14, 2005